FIG.1

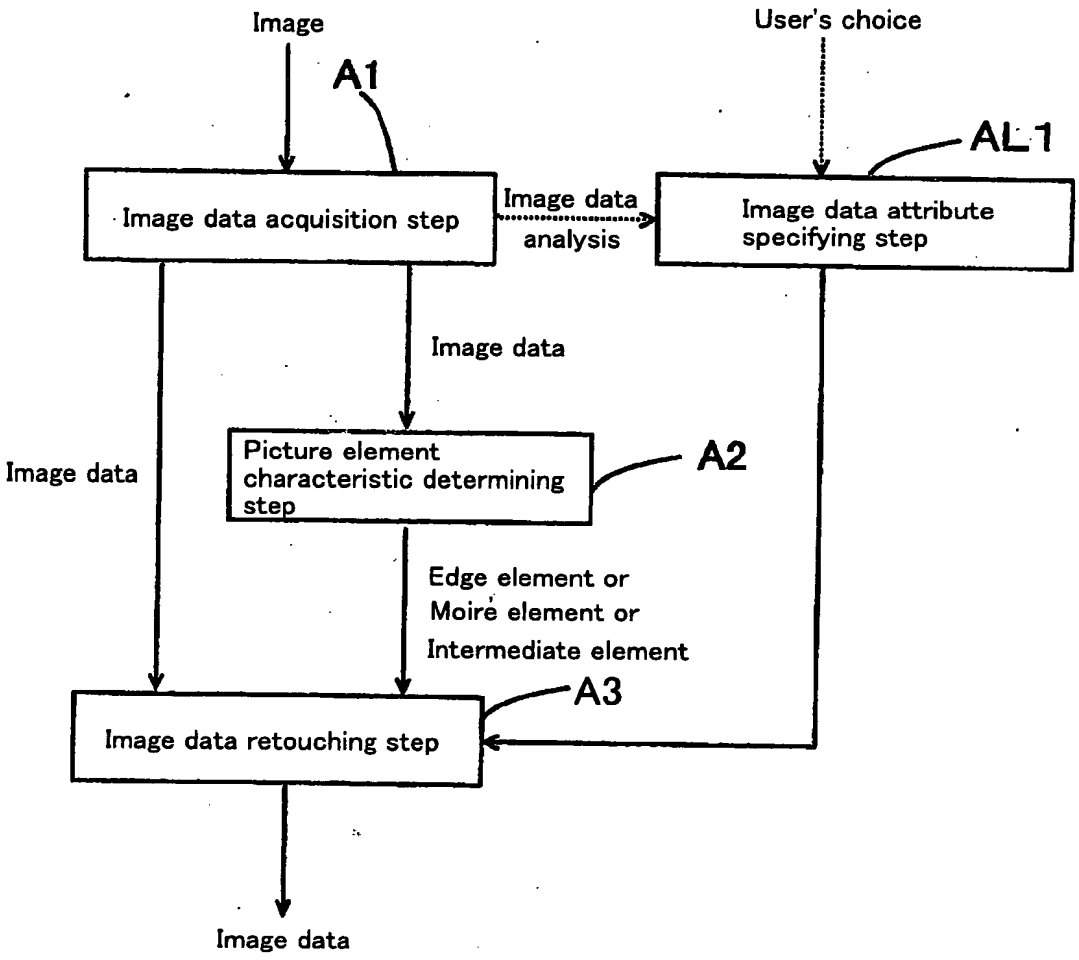
Image
A1
User's choice
AL1
Image data acquisition step
Image data analysis
Image data attribute specifying step
Image data
Image data
Picture element characteristic determining step
A2
Edge element or
Moiré element or
Intermediate element
A3
Image data retouching step
Image data

FIG.2

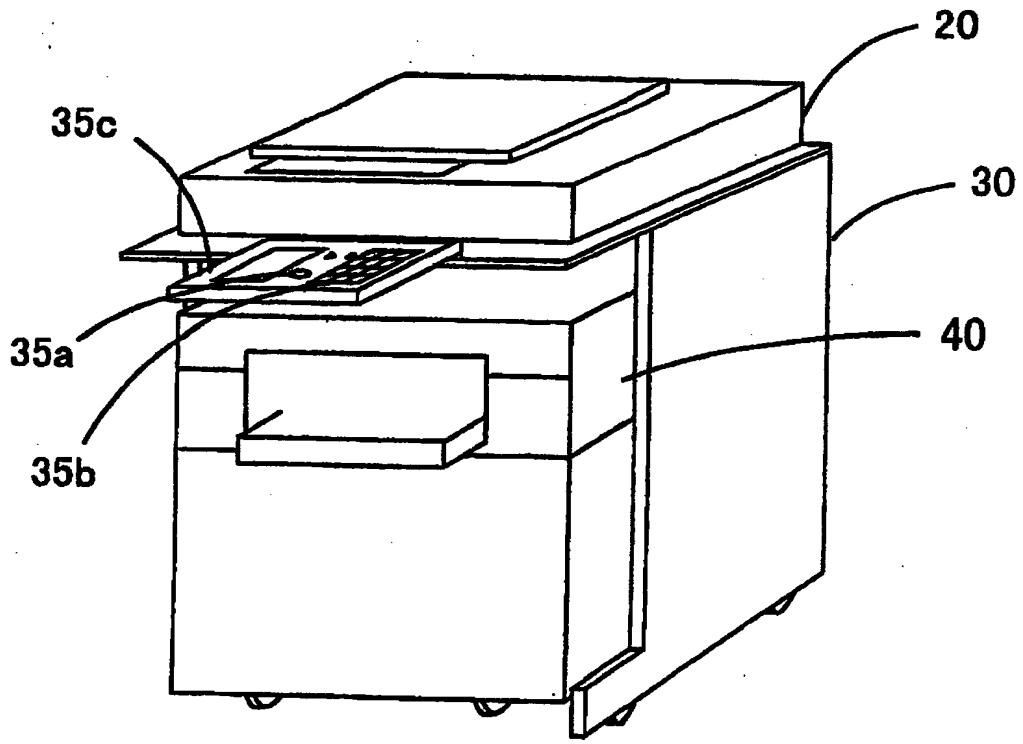

FIG.3

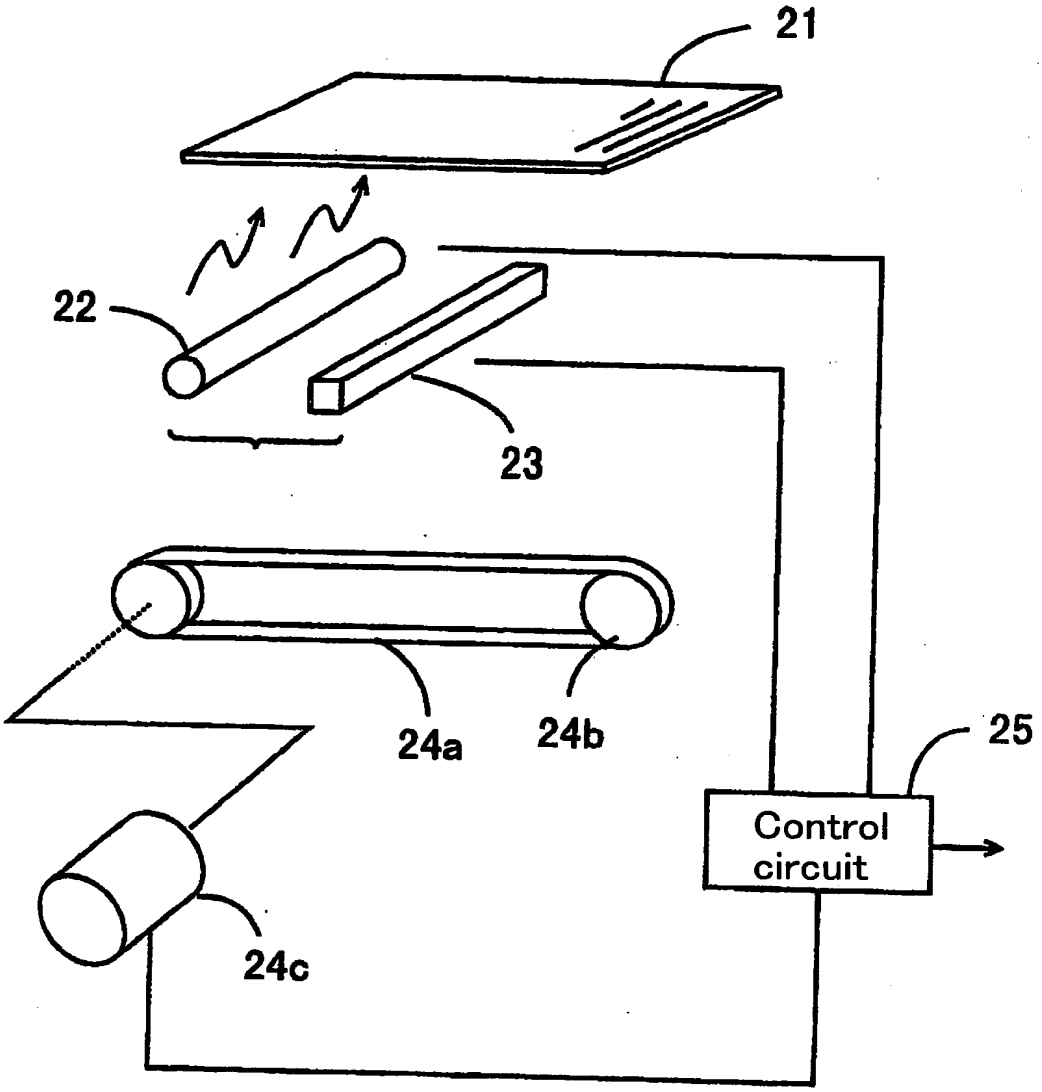

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FIG.4

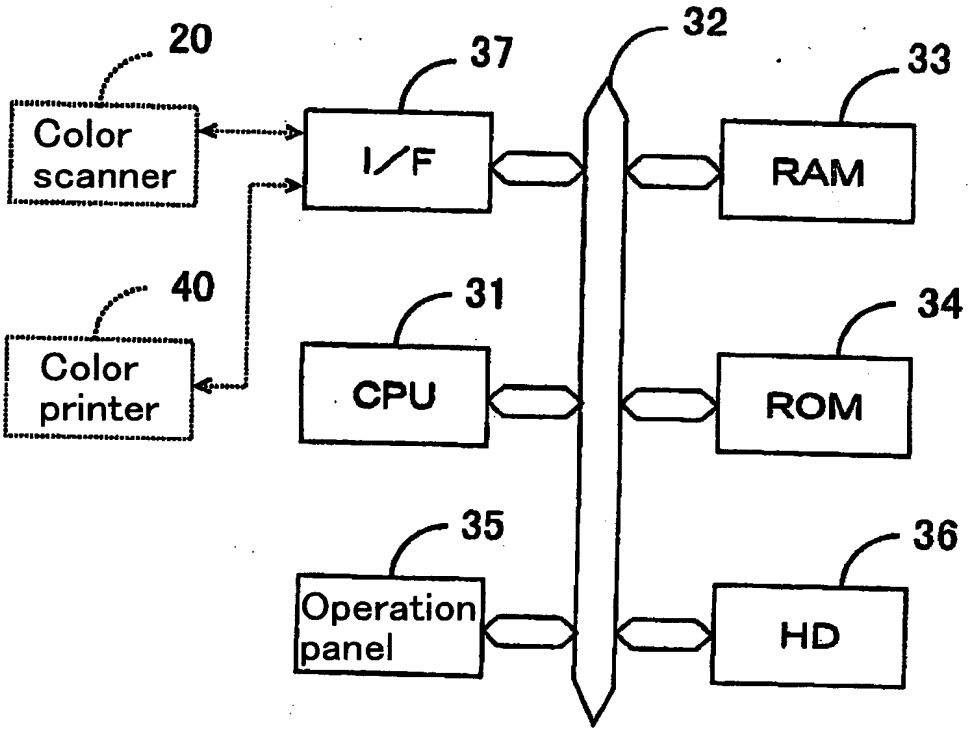
20
Color scanner
37
I/F
32
33
RAM
40
Color printer
31
CPU
34
ROM
35
Operation panel
36
HD

FIG.5

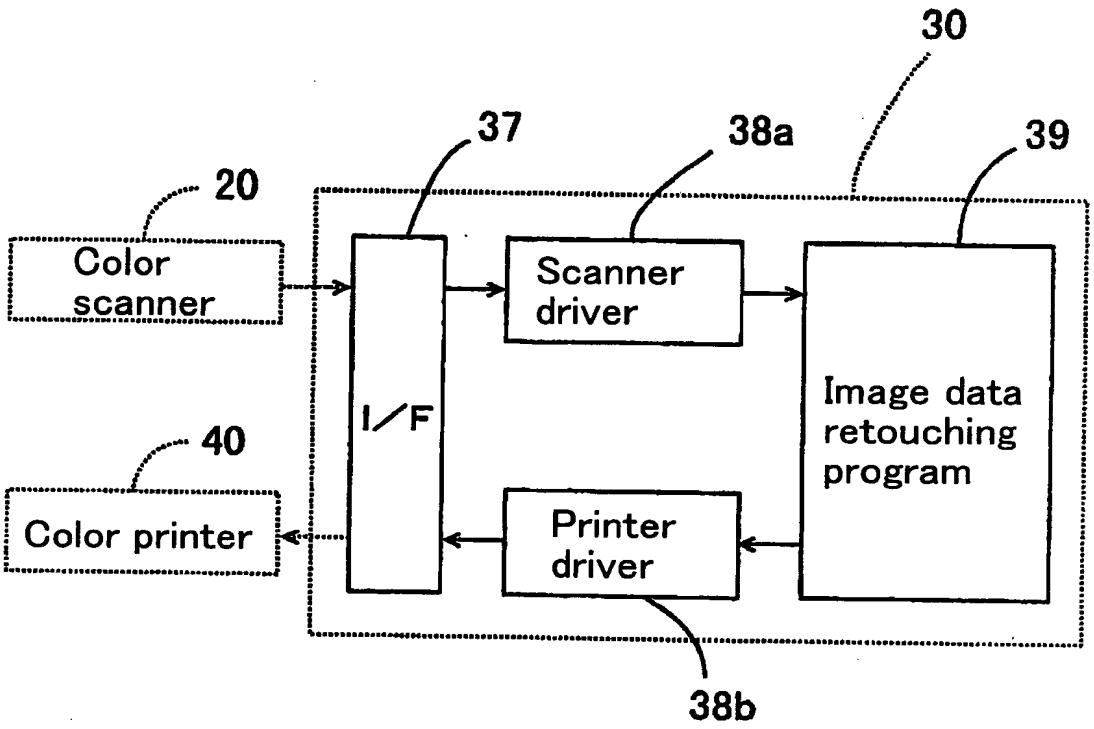
30
37
38a
39
20
Color scanner
Scanner driver
I/F
Image data retouching program
40
Color printer
Printer driver
38b

FIG.6

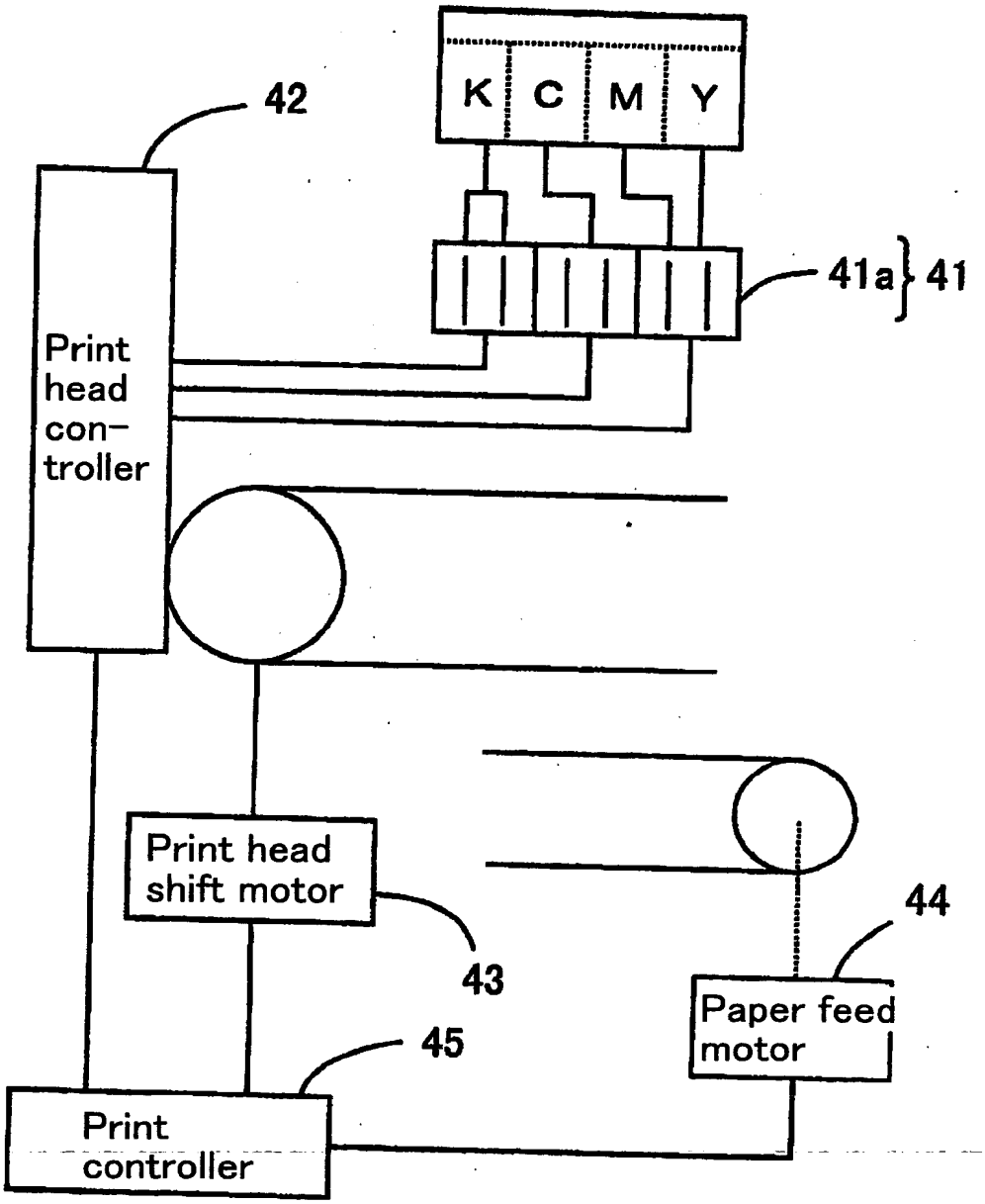
K
C
M
Y
42
41a
41
Print head con-troller
Print head shift motor
43
44
Paper feed motor
45
Print controller

FIG.7

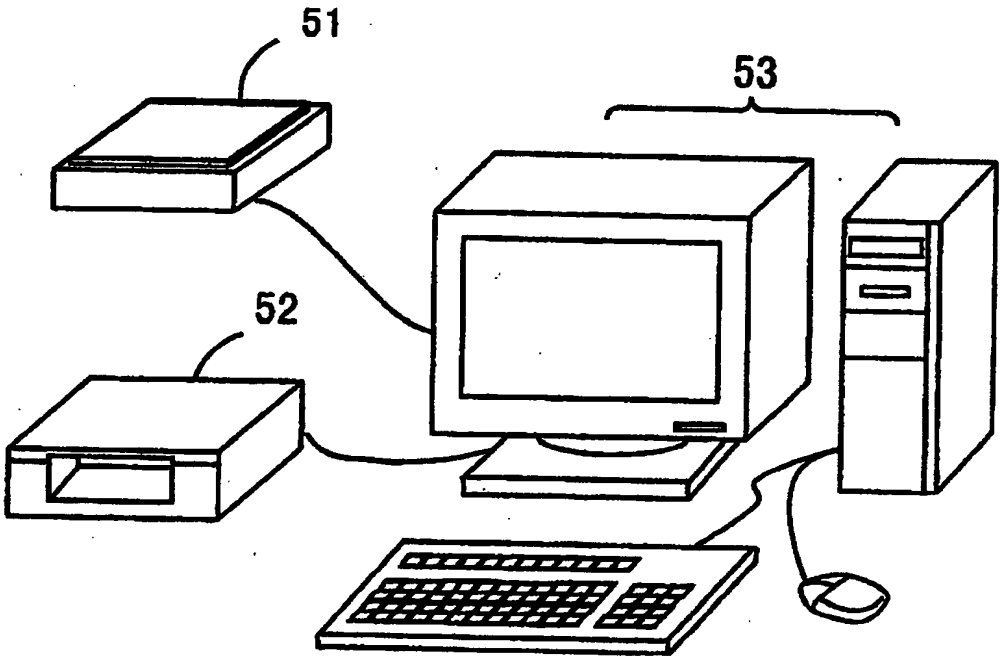

FIG.8

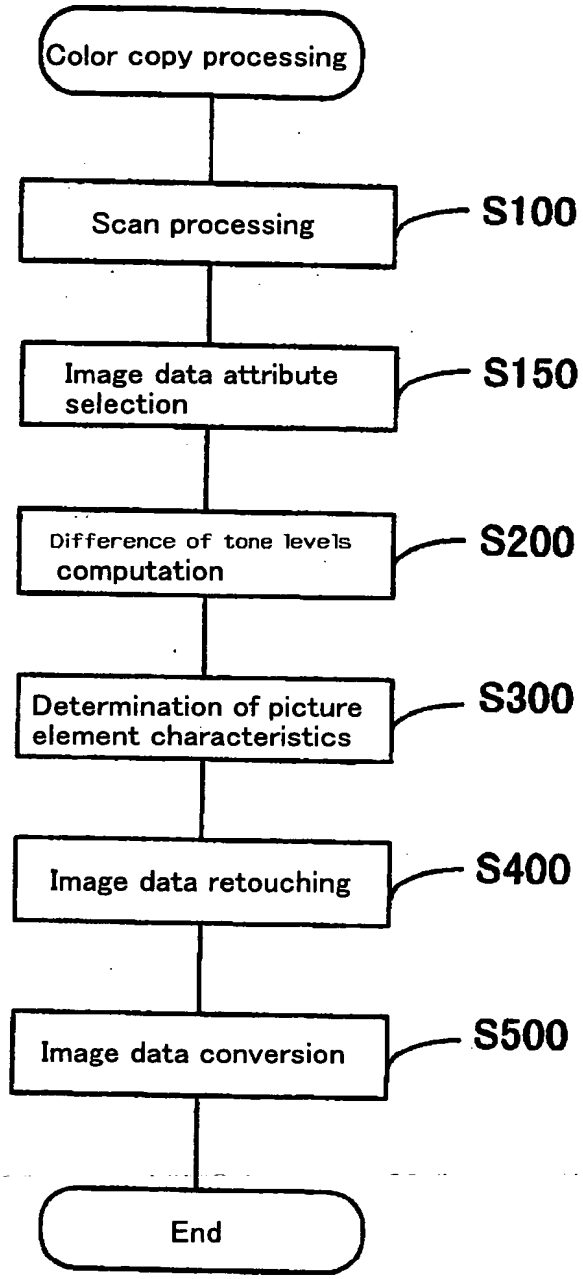

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FIG.9

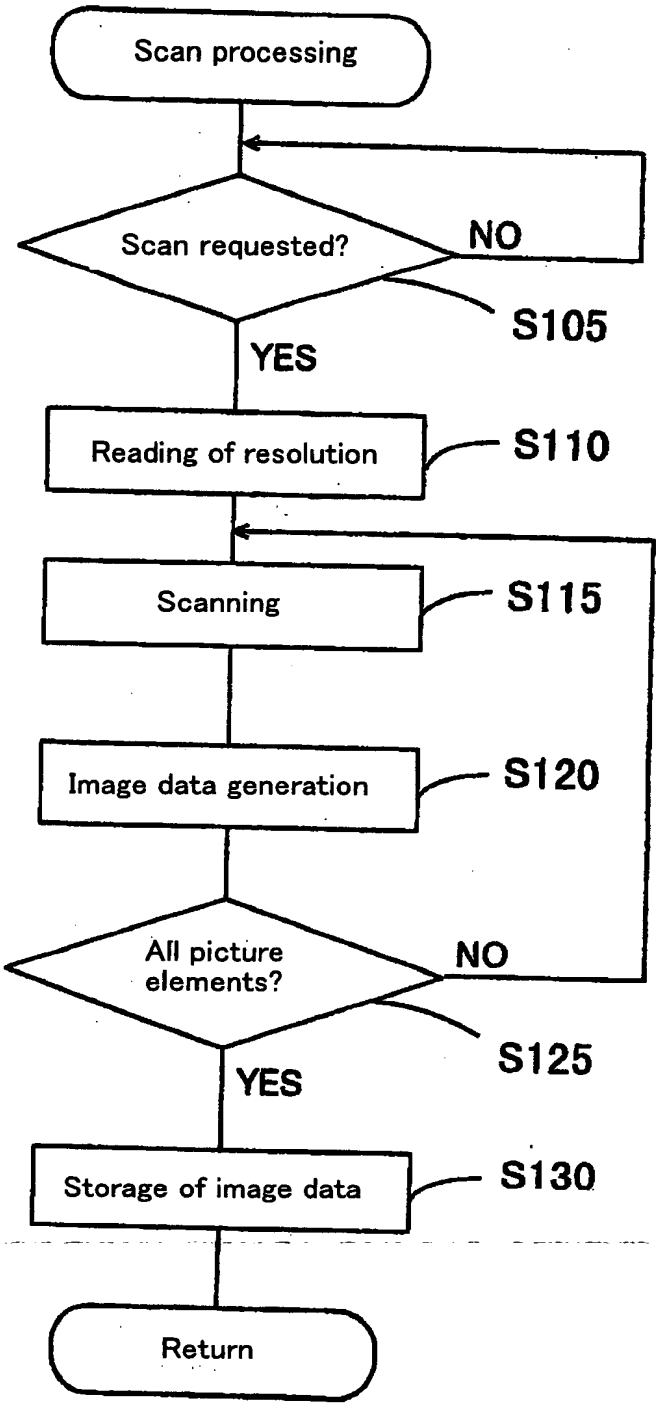
Scan processing
Scan requested?
NO
S105
YES
Reading of resolution
S110
Scanning
S115
Image data generation
S120
All picture elements?
NO
S125
YES
Storage of image data
S130
Return

FIG.10

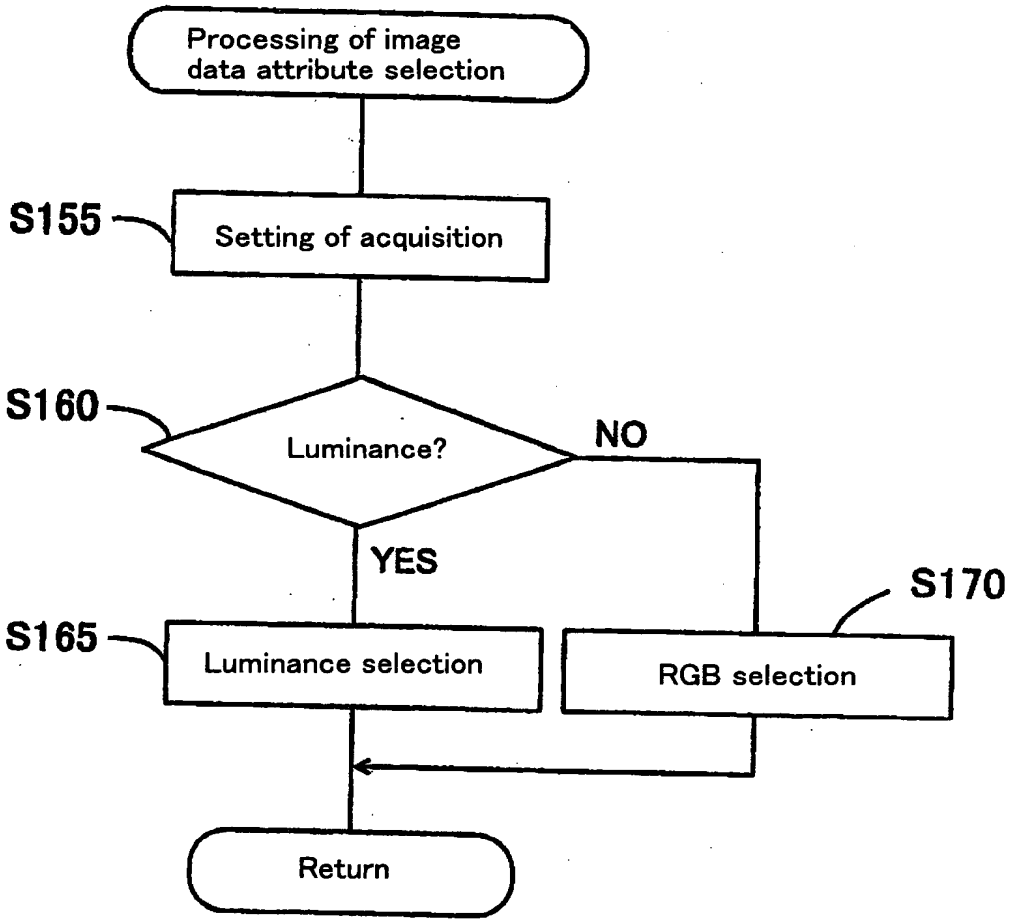
Processing of image data attribute selection
S155
Setting of acquisition
S160
Luminance?
NO
YES
S165
Luminance selection
S170
RGB selection
Return

FIG.11

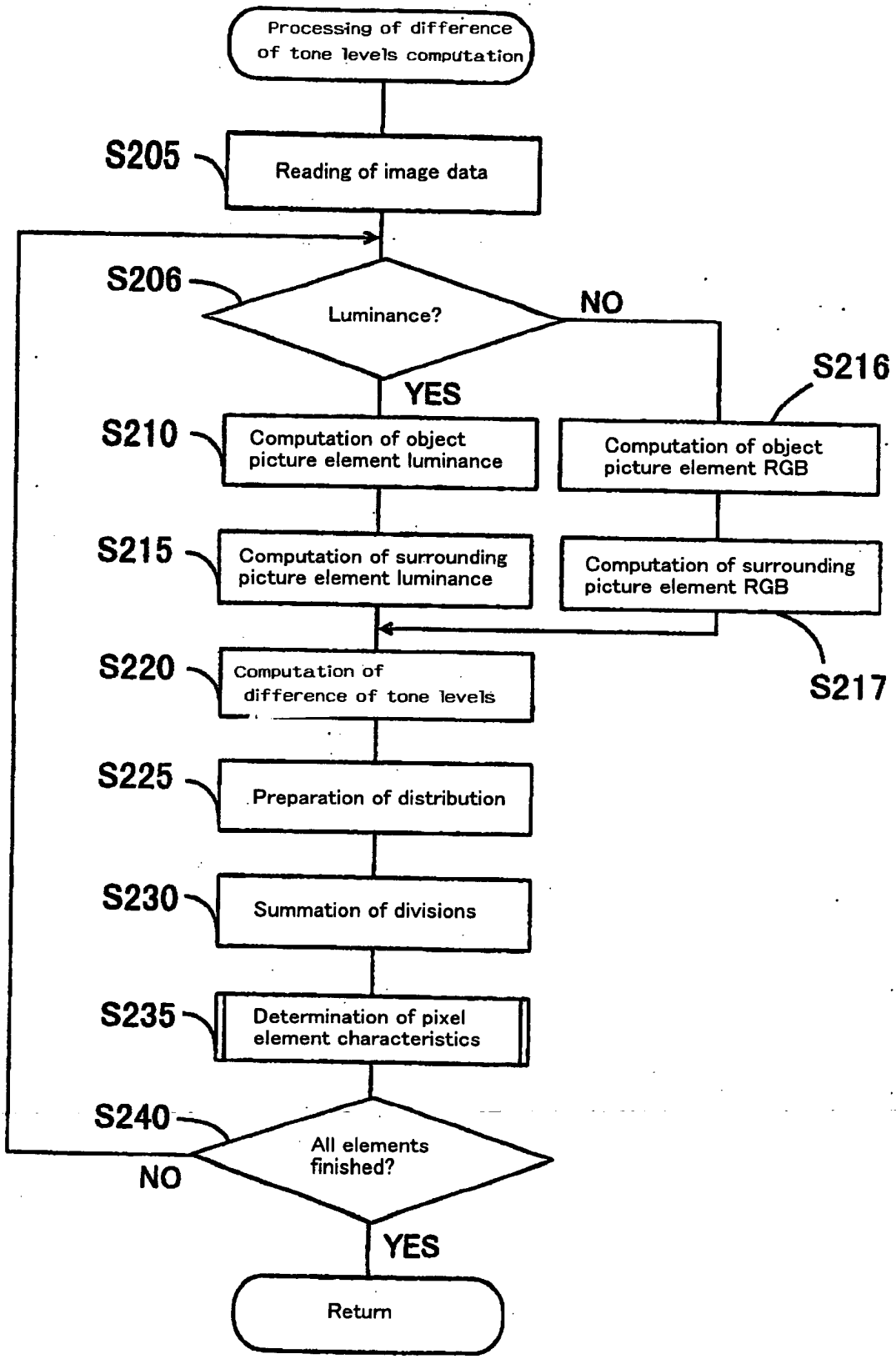
Processing of difference of tone levels computation
S205
Reading of image data
S206
Luminance?
NO
YES
S216
S210
Computation of object picture element luminance
Computation of object picture element RGB
S215
Computation of surrounding picture element luminance
Computation of surrounding picture element RGB
S220
Computation of difference of tone levels
S217
S225
Preparation of distribution
S230
Summation of divisions
S235
Determination of pixel element characteristics
S240
All elements finished?
NO
YES
Return

FIG.12A

Original image

	−2	−1	0	1	2
2	80	92	96	73	62
1	98	50	55	66	70
0	85	73	64	61	73
−1	69	70	82	93	97
−2	80	85	74	79	85

FIG.12B

Difference of tone levels

16	28	32	9	−2
34	−14	−9	2	6
21	9	0	−3	9
5	6	18	29	33
16	21	10	15	21

FIG.12C

Distribution

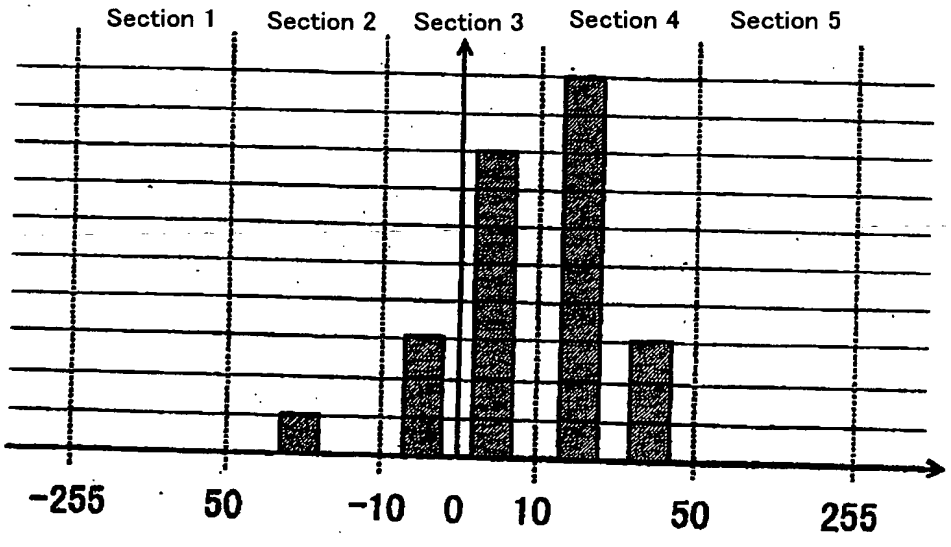

FIG.13

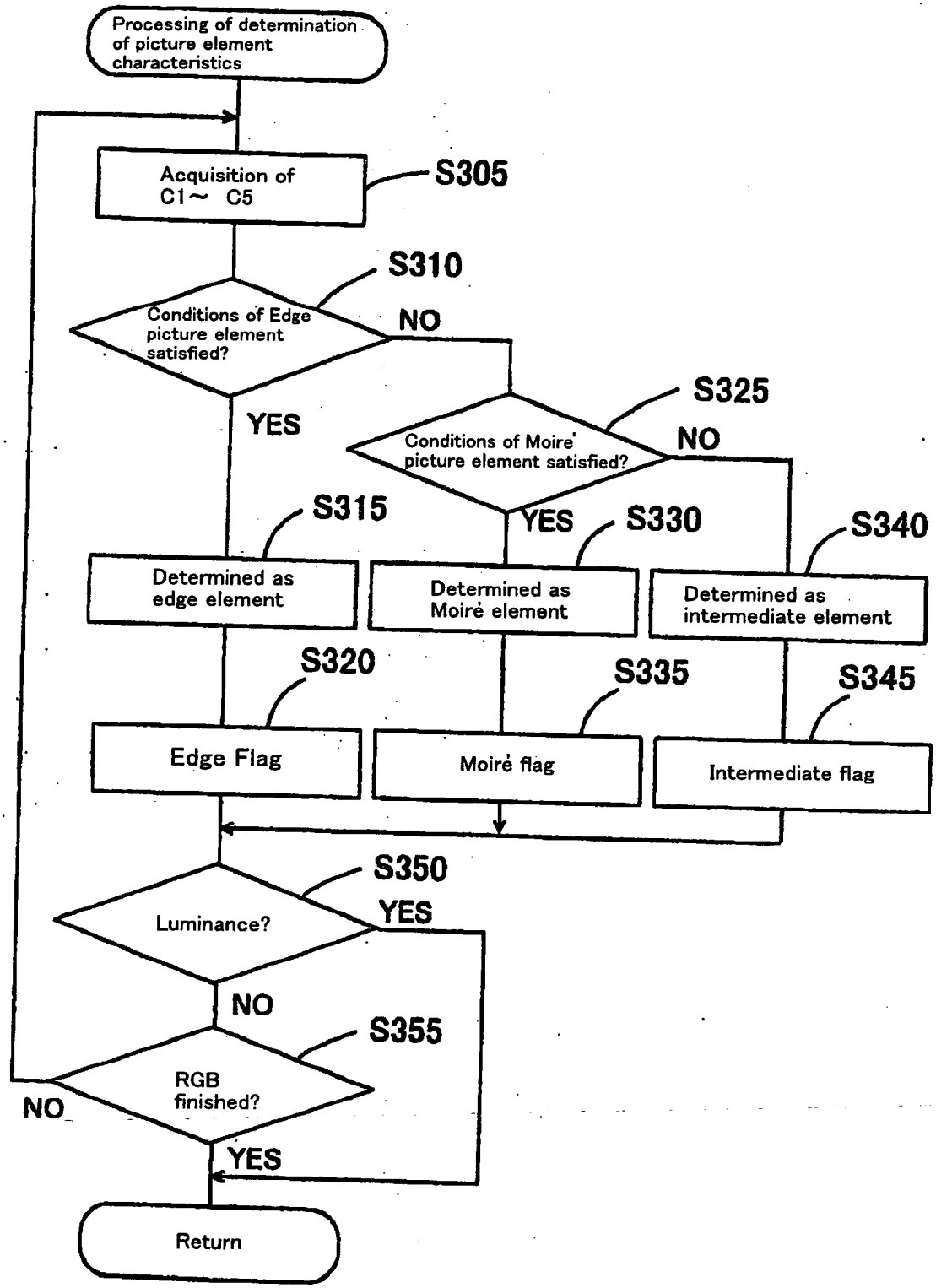
Processing of determination of picture element characteristics
Acquisition of C1~ C5
S305
S310
Conditions of Edge picture element satisfied?
NO
YES
S325
Conditions of Moire picture element satisfied?
NO
YES
S315
S330
S340
Determined as edge element
Determined as Moiré element
Determined as intermediate element
S320
S335
S345
Edge Flag
Moiré flag
Intermediate flag
S350
Luminance?
YES
NO
S355
RGB finished?
NO
YES
Return

FIG. 14A

Luminance

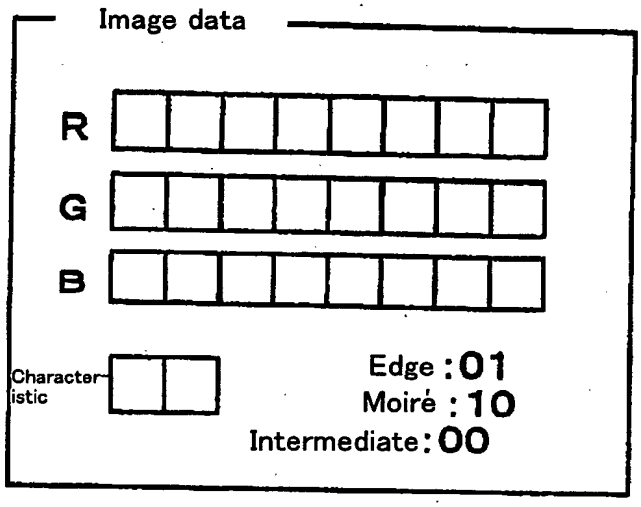

FIG. 14B

RGB

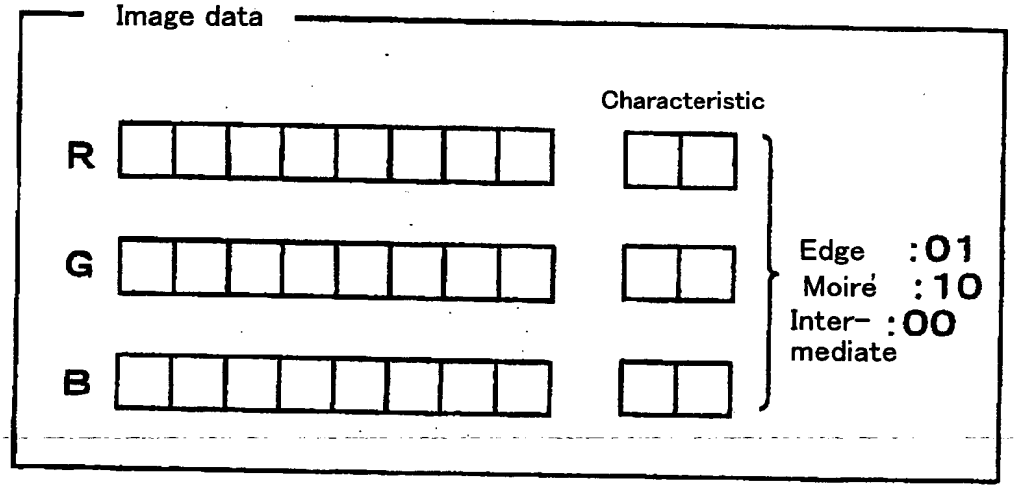

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FIG. 15A

0	0	0	1	1	2	0	0	2	2
0	0	0	1	1	2	2	2	1	1
1	1	1	1	1	2	0	0	1	1
1	1	1	1	1	2	0	0	1	1
2	0	2	2	2	0	2	2	1	1
2	0	2	2	2	0	2	2	1	1
								1	1

Edge : 1
Moiré : 2
Intermediate : 0

0	0	0	1	1	1	1	
0	0	0	1	1	1	1	
1	1	1	1	2	0	0	
2	2	2	0	2	2	2	
2	2	2	0	2	2	0	

R

FIG. 15B

1	1	1	2	2	2	
1	1	0	2	2	2	
1	0	1	2	0	2	
1	0	2	1	0	2	
2	2	0		1	1	

G

0	0	2	2	1	1	0
1	0		2	1	0	1
2	0	0	0	0	2	2
1	1	1	1	1	2	2
1	2	0	2	2	1	1

B

FIG. 16A

Original image

156	159	174	168	170
168	155	155	164	168
168	137	64	111	141
160	128	85	85	132
115	103	85	85	78

FIG. 16B

Difference of tone levels

92	95	110	104	106
104	91	91	100	104
104	73	0	47	77
96	64	21	21	68
51	39	21	21	14

FIG. 16C

Distribution

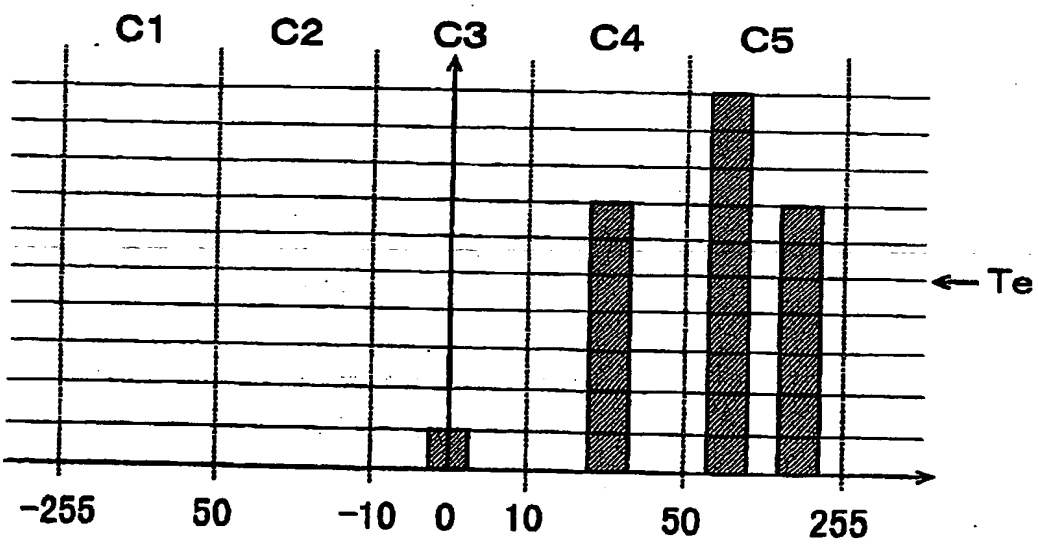

FIG. 17A

Original image

200	132	120	131	230
210	120	130	120	137
133	135	120	134	140
138	120	136	190	180
135	195	139	185	170

FIG. 17B

Difference of tone levels

80	12	0	11	110
90	0	10	0	17
13	15	0	14	20
18	0	16	70	60
15	75	19	65	50

FIG. 17C

Distribution

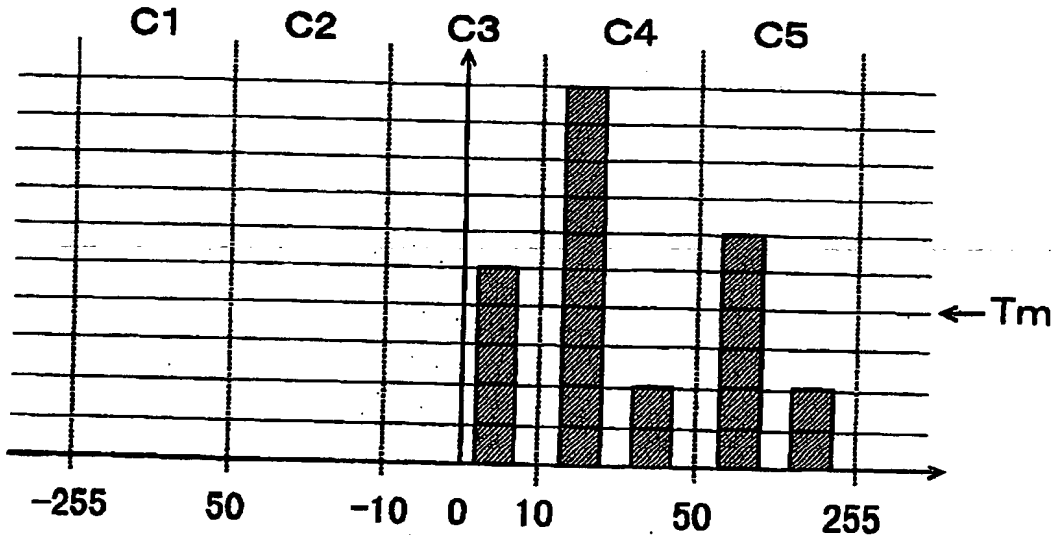

FIG. 18A

Original image

180	180	180	180	180
180	180	180	180	180
180	180	180	190	180
180	180	190	180	230
180	180	180	180	150

FIG. 18B

Difference of tone levels

0	0	0	0	0
0	0	0	0	0
0	0	0	10	0
0	0	10	0	50
0	0	0	0	-30

FIG. 18C

Distribution

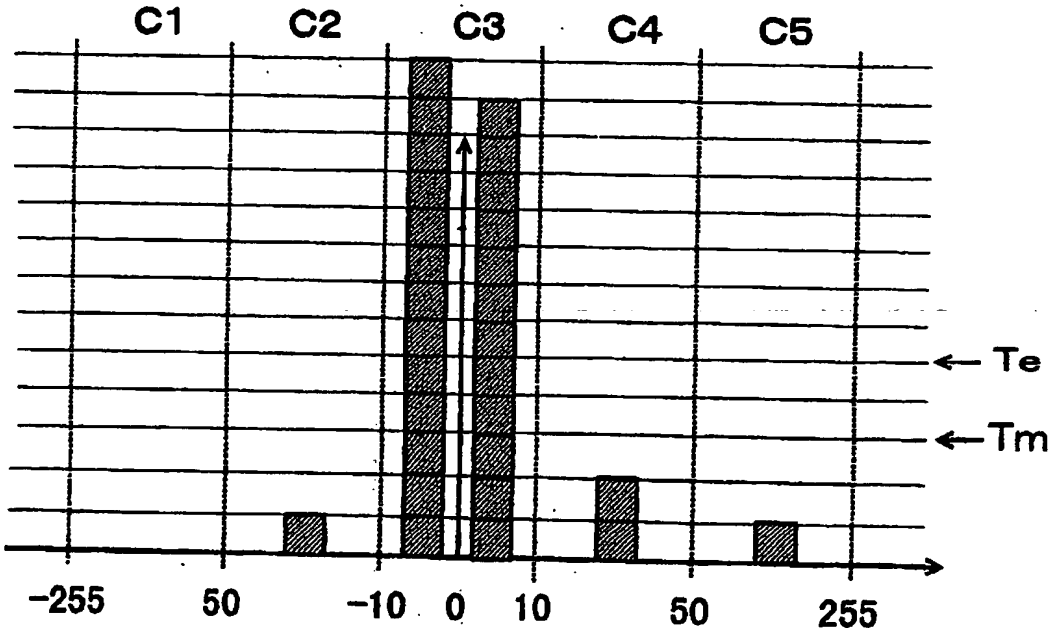

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FIG.19

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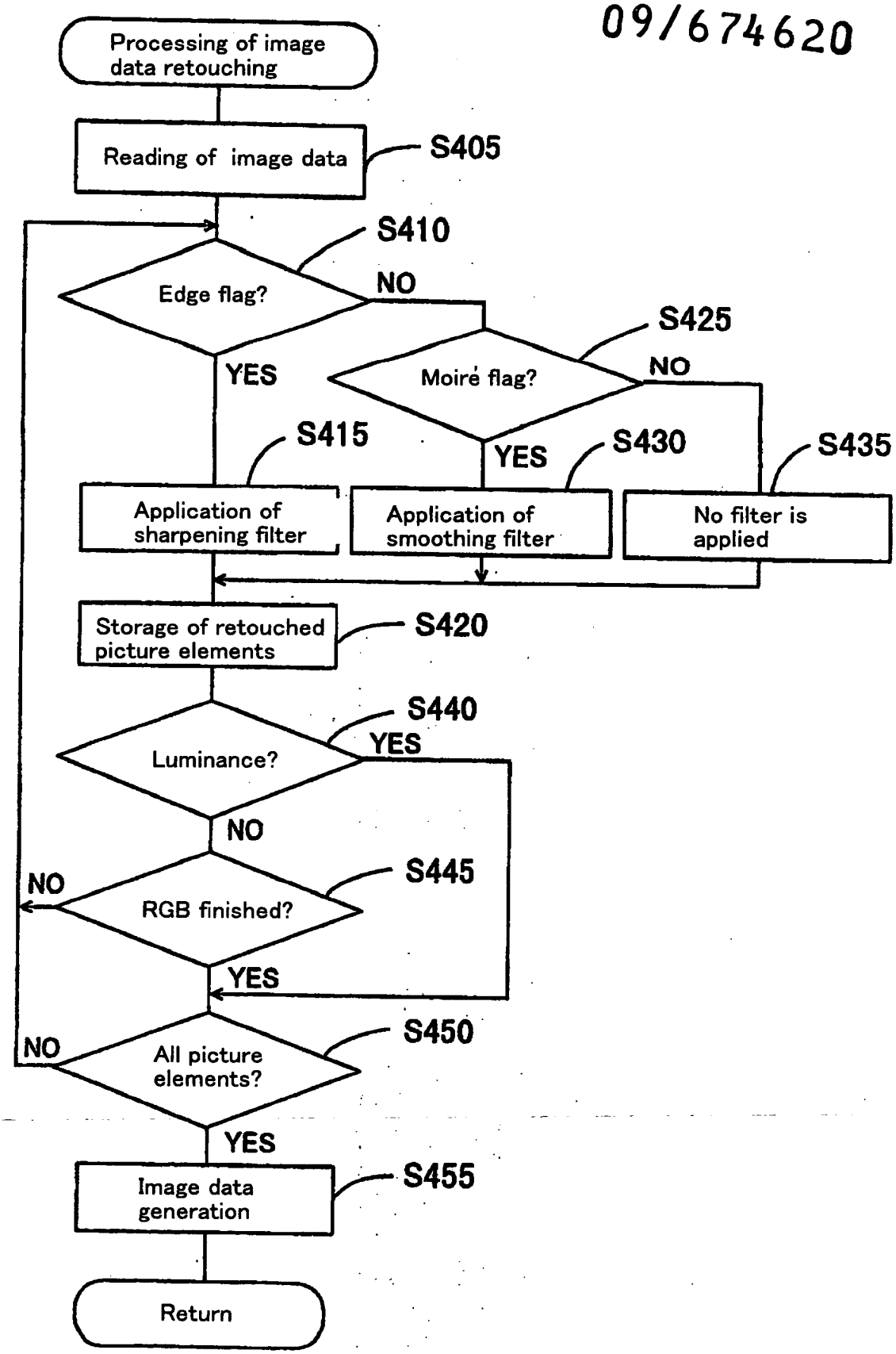

FIG.20

Sharpening filter

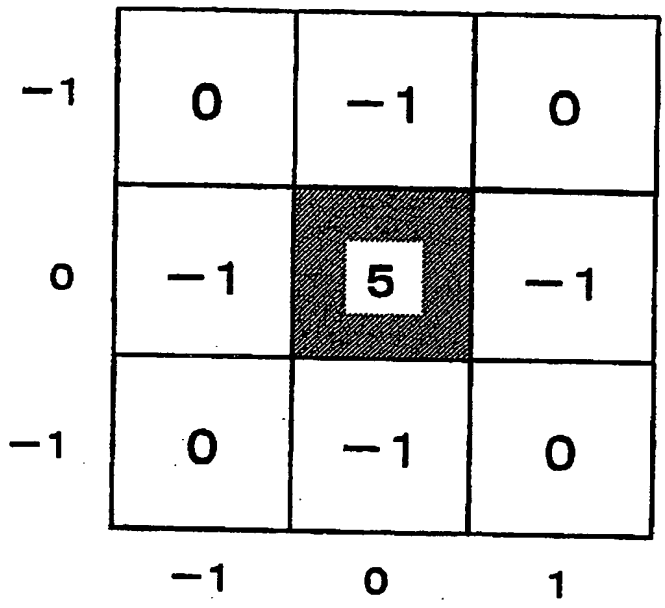

FIG.21

Smooting filter

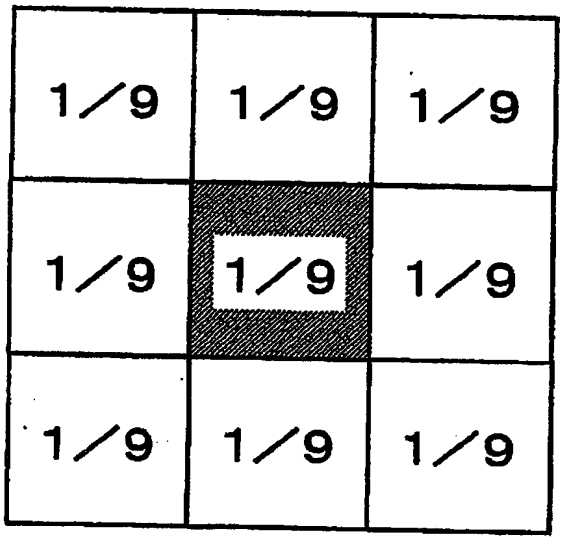

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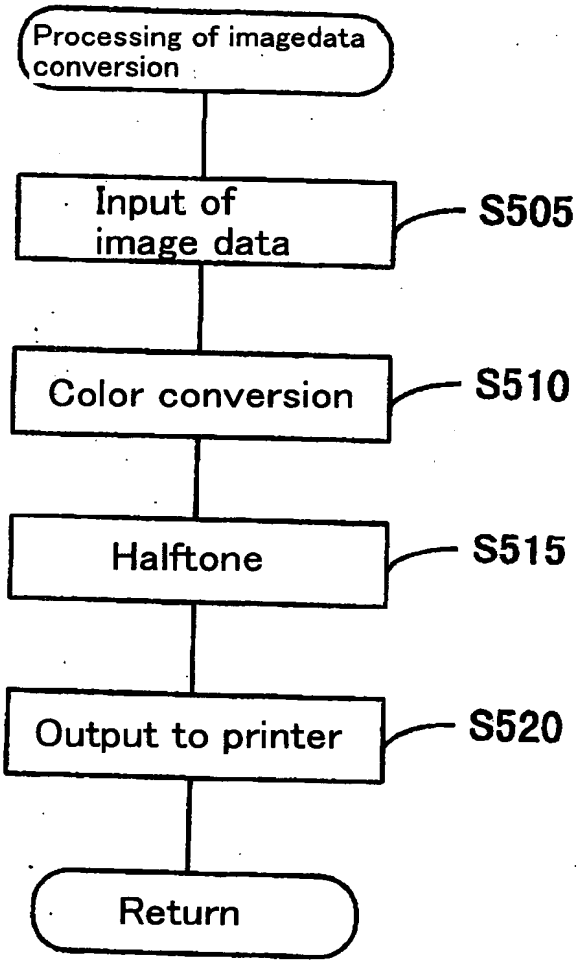
FIG.22


Processing of imagedata conversion
Input of image data
S505
Color conversion
S510
Halftone
S515
Output to printer
S520
Return